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AUTHOR	Faircloth, Beverly S.; O'Sullivan, Rita
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ABSTRACT

In 1997, the Wake County Public Schools, North Carolina, began a 3-year community-wide collaboration between existing programs and agencies expressly intended to coordinate efforts to serve at-risk children and their families. The Safe Schools Healthy Students grant program was built on 17 strategies aimed at addressing risk. Strategy 17 called for expanding the use of the NovaNET online learning system to all 17 high school labs and 2 alternative middle schools. NovaNET offers a comprehensive range of high school curricula, and each curricular unit is aligned with North Carolina's Standard Course of Study. Each lesson requires students to read instructional material on the computer, answer diagnostic questions, and sometimes complete written responses. An evaluation of the NovaNET program and its use was conducted through focus groups, 1 with 13 lab coordinators and the other with 13 guidance counselors, individual interviews with 10 lab coordinators, and interviews with 2 counselors and 25 students from 4 schools. Surveys were completed by 9 lab coordinators, 9 guidance counselors, 79 students, and 18 teachers. Findings show that NovaNET is used creatively and with encouraging impact. More than twice the projected number of students participated in NovaNET, and 73.8% of attempted credits were successfully completed. Some 843 students were back on track for graduation after being off-track before NovaNET use. Teachers and students saw many advantages to the system. Some suggestions are made for program improvement. Seven appendixes contain the participant surveys. (SLD)

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WAKE COUNTY PUBLIC SCHOOL SYSTEM

SAFE SCHOOLS GRANT

STRATEGY 17: NOVANET ONLINE LEARNING SYSTEM

YEAR 2

PROGRAM EVALUATION

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BEVERLY S. FAIRCLOTH

RITA O'SULLIVAN

EVALUATION, ASSESSMENT, & POLICY CONNECTIONS
SCHOOL OF EDUCATION
UNIVERSITY OF NORTH CAROLINA
CHAPEL HILL, NC 27599

(919) 843-7878

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INTRODUCTION

Wake County Public Schools have addressed the needs of at-risk students with an array of academic and alternative programs that reflect serious commitment of funds and time. The 1999-2000 academic year witnessed the beginning of a 9 million dollar, three-year, community-wide collaboration between existing programs and agencies expressly intended to coordinate efforts to serve at-risk children and their families. The grant, entitled *Safe Schools Healthy Students,* was funded by the Department of Justice, the Department of Health and Human Services, and the Department of Education in an effort to promote safe, inviting, and optimal learning environments for all students. The program was built upon a broad collection of 17 strategies aimed at addressing the risk and resilience factors associated with school safety and student success. Each strategy included a three-year sequence of action steps, focused on strengthening resources or services within the school system. These services ranged from improving at-risk screening and referral strategies, to mentoring, to substance abuse prevention, to improving school security.

Safe Schools Strategy 17 called for expanding the use of the NovaNET online learning system already available in some Wake County schools, to all 17 high school computer labs as well as 2 alternative middle schools. Counselors and teachers recommended NovaNET to students struggling in traditional classrooms, in the belief that the alternative approach would increase student success, retention, and graduation; seniors who needed course credit in order to graduate received highest priority when labs were full. NovaNET offers a comprehensive range of high school curricula encompassing:

English:	Grades 9 through 12 writing, literature, and reading
Mathematics:	fundamentals of mathematics, algebra I & II, geometry, trigonometry, advanced placement calculus, consumer mathematics
Social Studies:	U.S. government, U.S. history, world history, geography, economics
Science:	anatomy & physiology, biology, earth science, environmental science, chemistry, advanced placement chemistry and physics
Foreign Language:	French, Spanish, Latin, German, Japanese, Russian
Electives:	accounting, health & first aid, physical education, music, keyboarding, psychology, photography, critical thinking & study skills, life coping skills
SAT/ACT prep.:	practice tests and curricula.

Each of these curricular units is aligned with North Carolina's Standard Course of Study. Although Wake County students do not participate in the more advanced or interactive aspects of the program (with the exception of a small number of educational games), NovaNET also includes national discussion and writing forums, links to numerous educational Internet resources, as well as a collection of fully searchable, commonly used reference documents.

Each NovaNET lesson requires students to read instructional material provided on the computer screen followed by diagnostic questions (online); a few include written assignments. Students' online answers are followed by new information, or further explanation, depending on the student response. Many students work without text support; neither NovaNET textbooks nor printed copies of lessons are available (either for use in class or to take home). When extra related texts are available at the school, lab coordinators secure copies for use in the computer lab. NovaNET courses used by Wake County students include no face-to-face interaction with an online instructor; when lab coordinators are available and familiar with the subject material, they may provide individual instructional support requested by

students. The program provides unit tests which determine 75% of the student's grade; state end-of-course exams (EOC's) account for 25% of the grade. Successful completion of the entire sequence of readings, questions, written assignments, unit tests, and the EOC comprises successful completion of the course credit, which may be applied to graduation requirements. Administrators at each school make the final determination of whether course credit may be assigned for NovaNET work.

The Safe Schools goals for NovaNET address expanding the availability, funding, staffing, training, and awareness of the program, in order to increase its frequency of use. The first year of the program included in-service training for faculty, who were then responsible for identifying at-risk students and referring them to use NovaNET. At four county high schools, the program provided funds for computer lab coordinators responsible for working with students and tracking their progress with classroom teachers and students' parents. At the other thirteen high schools and two alternative middle schools, lab coordinator positions were funded through alternative sources such as funds from the guidance or math departments, or were filled by volunteers; at six sites positions were shared or part-time. Currently in the second year of the three-year program, NovaNET is available in the computer labs of all Wake County high schools. Although the grant supplied 10 portals per school, schools have added portals when possible, bringing the Wake County total to over 250.

School District Context

Located in central North Carolina, Wake County consists of a blend of urban, suburban, and rural areas. Three universities, the state capital, 11 municipalities, one of the country's largest research centers for business and industry, and numerous small farms are all located within its boundaries. The county is large (864 square miles), the current population of 600,000 placing it in the top 5% of counties nationwide. Wake County Public School System (WCPSS) is the second largest in the state, and the 30th largest in the nation (97,600 students/122 school sites, 2001 WCPSS data). The area's rapid population growth is reflected in Wake County's standing as the third fastest growing district among the 40 largest school districts in the country. This growth, which is projected to continue, presents a staggering challenge to the school system's commitment to meet the needs of all students.

Not only is the size and growth of Wake County marked by extremes, the racial, cultural, and socio-economic diversity of the citizens and students is similarly extreme. Student population demographics (2001 WCPSS data) include 64% Caucasian, 27% African-American, 4% Hispanic, 3% Asian, and 2% Other. Contained within this diverse profile are over 100 different languages and cultures from all over the world. There are also pronounced socio-economic differences between the citizens of the county. Within Wake County, 11.3% of school-aged children (16,282 children) live in poverty (1997 U.S. Census), and 20.0% (19,516 students) are eligible for free/reduced lunch (2001 WCPSS data).

Throughout the county, neighborhoods with high concentrations of at-risk children experience serious educational challenges. Although on average Wake County student achievement is exemplary compared to state averages, 15% of the student population (~15,000 students) performs below grade level. In 1999 there were 13,899 out-of-school suspensions or expulsions, 1,575 students on probation, and 2,756 students involved in the juvenile justice system (1999, North Carolina State Bureau of Investigation). In 1996 the countywide juvenile violent crime rate was 10.32 arrests per 1,000 children compared to 1.82 for the state and 1.34 for the nation. Due in part to the rapid population growth, extreme diversity, and other high risk factors, community wide resources and services struggle to meet

demands. Countywide, there are literally thousands of children needing resources and intervention; this number is increasing as the population grows. The merit of a program like Safe Schools, designed to coordinate efforts to serve the county's student population using strategies such as NovaNET, is noteworthy.

Evaluation Design

The purpose of this evaluation is to describe NovaNET use and its effects during the second year of the Safe Schools program (2000-01). Table 1 presents the **Evaluation Questions** and **Data Collection Strategies** in an **Evaluation Crosswalk** (O'Sullivan, 1991). For each of the evaluation questions posed, multiple data sources were used to gather information. Two focus groups were conducted, one with 13 of the county's 19 NovaNET computer lab coordinators, one with 13 of the 19 lead guidance counselors (referred to as student deans) who refer students to NovaNET. All lab coordinators and lead counselors (deans) were invited to the focus group meetings, which were scheduled by the county Research and Evaluation department; all attendees were included in data collection. The Research and Evaluation department also selected 10 lab coordinators (purposeful/non-random selection representing both well established and newer NovaNET programs) to participate in individual interviews (five of the interviewed lab coordinators had also participated in focus groups). Two guidance counselors and 25 students representing 4 schools, each of whom were available during school site visits, also participated in individual interviews (see Appendices A & B for protocols). Questionnaires were completed by 9 of the 13 lab coordinators, and 9 of the 13 guidance counselors who attended focus groups (Appendices C & D). Four lab coordinators chose to conduct open-ended surveys concerning the impact of the program with all participating students at their school; one school surveyed all referring teachers at their school as well. Surveys were completed by 79 of 313 students at the four schools (some of whom also participated in interviews) and 18 referring teachers from one school (Appendices E, F & G).

TABLE 1. NOVANET EVALUATION CROSSWALK

Issues	Focus Groups	Inter-views	Question-naires	Surveys	System Data
1. Were projections set and met regarding number of students participating in NovaNET?					X
2. Does the average ABLE grade level score increase following student participation in NovaNET?					X
3. What is the average amount of time spent per student using NovaNET? Is there a general trend among schools?					X
4. In what ways do student participants of NovaNET feel they have or have not benefited from NovaNET?		X	X	X	
5. In what ways do NovaNet coordinators believe NovaNet benefits or does not benefit student participants?	X	X	X		
6. How are students selected to participate in NovaNET? Is there a general trend from school to school?	X	X	X	X	
7. How is NovaNET implemented at each campus? Is there a general trend among schools?	X	X	X		
8. What problems have NovaNET coordinators experienced? How severe are the problems? Are they easily solved?	X	X	X		
9. Are overall gender, ethnicity, language, and special program demographics of student participants representative of the overall WCPSS student population?					X

Results

1. Were projections set and met regarding numbers of students participating in NovaNET?

Initial goals for the Safe Schools initiative projected that 600 high school students across the county would take part in NovaNET on-line learning during the second year of the grant. This goal was exceeded substantially as more than 1300 students attempted at least one NovaNET course at 15 high schools, 2 alternative high schools, and 2 alternative middle schools (see Table 2). A second NovaNET course was attempted by 485 of the participants (35.4 %); 24 attempted a third course (1.7 %). A total of 1878 courses were attempted by the pool of students attempting 1, 2, or 3 courses.

Typical catalysts triggering referral to NovaNET were failure in traditional classes, serious attendance issues, and personal issues such as illness or pregnancy. Seniors requiring course credit in order to graduate were consistently given priority when labs were full and access to portals was limited. Students who transferred to Wake County during high school were also offered NovaNET as a means to make up coursework needed to meet state graduation requirements.

Designers of the Safe Schools program had also anticipated that NovaNET would prove useful to the nearly 3,000 Wake County students involved in the Juvenile Justice system. Only three Juvenile Justice students were included in the official, year-end, NovaNET data required by the central office and submitted by lab coordinators. The lack of participation by this population is being addressed currently by the school system, with attention being given to careful coordination between Juvenile Justice personnel and NovaNET lab coordinators. Such attention should better serve the Safe Schools agenda by involving more of the students for whom Strategy 17 was specifically designed.

WCPSS additionally projected that 80% of attempted credits would be successfully completed. As seen in Table 3 A, an average of 73.8% of students system-wide were successfully completed, although the results varied widely across subject area. Students undertaking Elective courses (94.4% attempted credits earned), Social Studies (80.6% credits earned) and Math courses (79.7% credits earned) were successful at the projected levels. English students were slightly less successful (68.4% of attempted credits earned), and only 48.6% of Science students successfully completed course work. Among the 1,899 NovaNET courses attempted, 839 (50.3%) enabled students to recover "on time for graduation" status, and 417 (25.0%) moved students closer to graduation (having earned credits needed for graduation but not enough to be on track to graduate with their class). An additional 411 (24.7%) have not made progress toward graduation, due either to receiving an Incomplete (n=28) or a failing grade (n=383). (Data was missing for 232 courses.) Table 3 B illustrates the impact on graduation status of each NovaNET course attempted. (Wake County schools require between 20-24 credits for graduation, depending on the school and program.)

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TABLE 2: NovaNET Status by School

School Name	Program Status	% of base school population	# (%) NovaNET population system-wide	# NovaNET Portals	Staffing (at time of study)	Applications	Primary Referral Mechanisms
1. Mary E. Phillips High	Established	58.1% of 129	75 (5.5%)	32	1 PTC	5 of 7 periods; Remediation, study skills	Guidance, Teachers, Administration
2. Garner High	Established	8.6% of 2020	174 (12.7%)	35	1 FTC, 1 PTT	All periods, before/after school; Credit recovery, remediation, EOC's, Electives, Enrichment, SAT Prep, Homebound students, Special Ed, ESL	Guidance, Teachers, Administration
3. Athens Drive High	Established	7.2% of 1771	128 (9.3%)	14	Position	All day, before/after school; Primarily seniors for graduation	Guidance, Teachers
4. Wakefield High	Established	6.8% of 870	59 (4.3%)	10	1 PTC	New program; Primarily basic skills & competency	Guidance
5. Cary High	Established	6.4% of 1742	112 (8.2%)	22	1 FTC, 1 FTT	All day, before/after school, summers, Credit recovery, remediation, EOC's, Electives, Enrichment, SAT Prep, Homebound students, Special ed, ESL	Guidance, Teachers, Administrators, Self-referral
6. Apex High	Established	5.6% of 1973	110 (8.0%)	14	1 FTC, 3 PTT	All day, before/after school; Primarily course recovery	Guidance, Teachers
7. Southeast Raleigh High	Established	2.1% of 1984	41 (3.0%)	18	1 FTC, 1 PTT	All day, before/after school; Primarily course credit for graduation	Guidance
8. Mt. Vernon Redirection	New	100.0% of 52	52 (3.8%)	10	1 PTC	All day, after school; Competency, EOC's	Teachers
9. East Wake High	New	8.9% of 1739	155 (11.3%)	10	1 FT	All periods, after school; Competency, SAT prep	Teachers, Evening Program
10. Broughton High	New	7.7% of 1680	130 (9.5%)	26	1 PT, 1 Vol.	All periods & after school; Primarily for graduation and remediation	Teachers, Administrators
11. Enloe High	New	2.8% of 2382	67 (4.9%)	10	1 PTC	Just getting started at time of questionnaire	Just getting started at time of questionnaire
12. Sanderson High	New	2.0% of 1584	32 (2.3%)	20	Just getting started	Just getting started at time of questionnaire	Just getting started at time of questionnaire
13. Wake Forest-Rolesville High	New	2.0% of 1183	24 (1.8%)	15		Just getting started at time of questionnaire	Just getting started at time of questionnaire
14. Leesville Road High	Not yet operating	2.2% of 1995	44 (3.2%)	10	N/A	Lab not yet operating at time of questionnaire	Lab not yet operating at time of questionnaire
15. Millbrook High	Not yet operating	1.6% of 1845	30 (2.2%)	17	N/A	Lab not yet operating at time of questionnaire	Lab not yet operating at time of questionnaire
16. Richard Milburn High	Data Missing	43.1% of 130	56 (4.1%)	10	Data Missing	Data Missing	Data Missing
17. Green Hope High	Data Missing	4.1% of 1352	56 (4.1%)	10	Data Missing	Data Missing	Data Missing
18. Fuquay-Varina High	Data Missing	0.7% of 1541	11 (0.8%)	10	Data Missing	Data Missing	Data Missing
19. Longview Middle/High	Data Missing	Population varies	13 (0.9%)	10	Data Missing	Data Missing	Data Missing
Total		X % = 15.0%	1369 (100%)	279			

FTC = Full-time Coordinator, PTC = Part-time coordinator, FTT = Full-time Teacher, PTT = Part-time teacher, Vol. = Volunteer

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TABLE 3: PROGRESS TOWARD GRADUATION

3. A. Credits Earned Toward Graduation

Subject	Credits Attempted	Credits Earned	% Credits Earned
Elective	108	102	94.4 %
Social Studies	232	187	80.6 %
Math	605	482	79.7 %
English	326	223	68.4 %
Science	220	107	48.6 %
System	**1491**	**1101**	**73.8 %**

Incompletes (n=28) not included in total.

3. B. Student Graduation Progress per NovaNET Course (all courses)

Eligibility	Frequency	%
On track for graduation	839	50.3 %
Closer to graduation	417	25.0 %
Data missing	411	24.7 %
Total	**1667**	**100.0 %**

As illustrated in Figure 1, the grades for courses completed successfully were widely distributed. Students were most successful earning passing grades in electives (94%) and least successful in science (48%).

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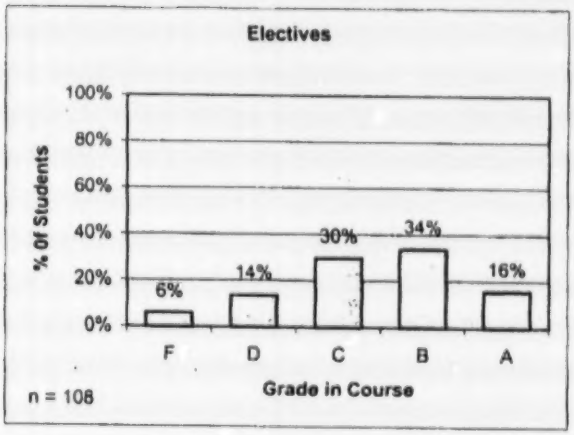
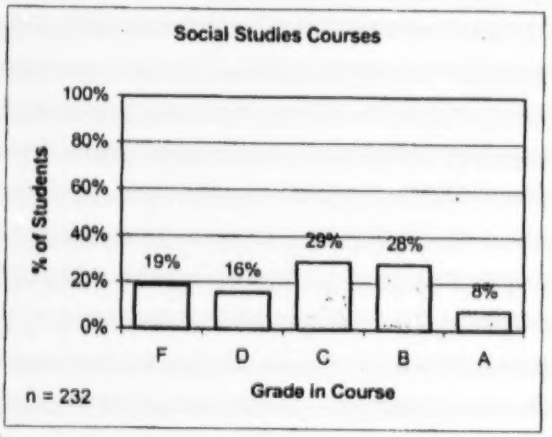
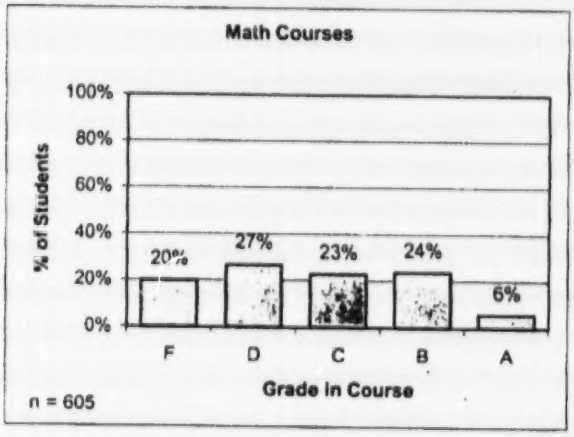
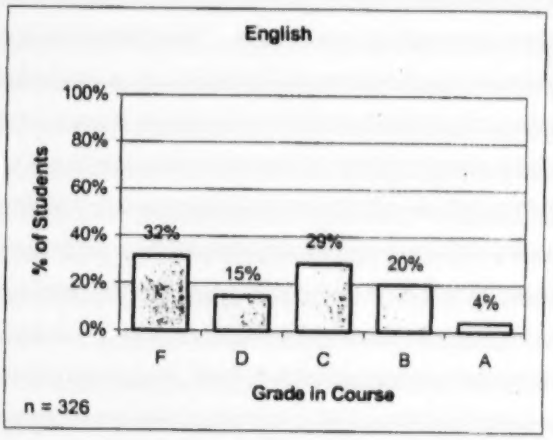
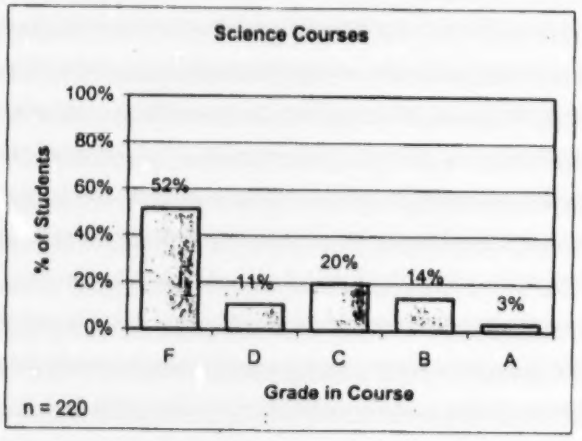
FIGURE 1: PROFILE OF STUDENT SUCCESS IN NOVANET CREDIT COURSES (Course Grade)







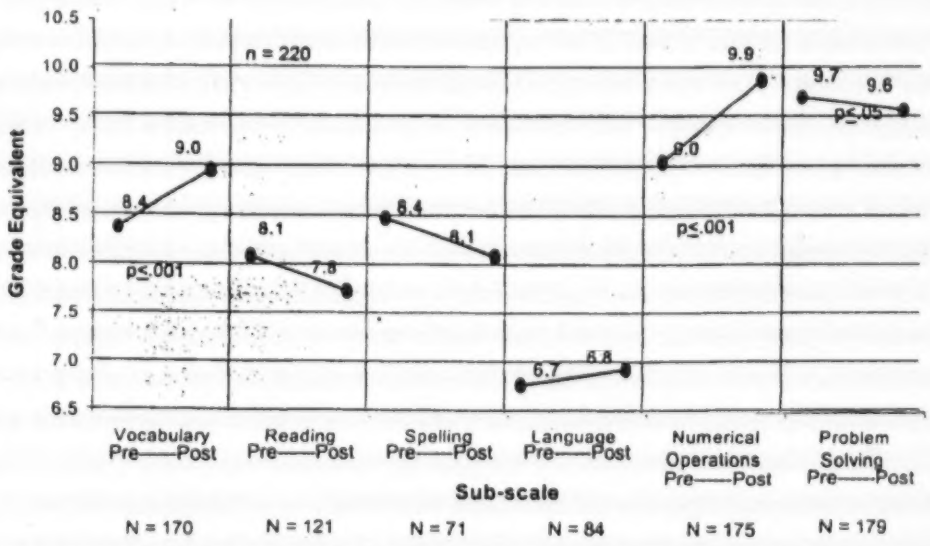




2. Does the average Adult Basic Learning Examination (ABLE) grade level score increase following student participation in NovaNET? / What is the average grade level score change in ABLE Scores following student participation in NovaNET?

The Safe Schools program delineated specific pre- and post-intervention evaluation measures. Strategy 17 included the Adult Basic Learning Examinations (ABLE) administered to NovaNET students at the outset and near completion of their NovaNET coursework, although many students missed either the pre- or post-test. ABLE is a standardized, multiple-choice, achievement battery with sub-tests in Vocabulary, Reading Comprehension, Spelling, Language, Number Operations, and Problem Solving. ABLE results provide grade level scores (year and month) of students' performance on each sub-test. As shown in Figure 2, changes in ABLE scores varied by subcategory, with Vocabulary and Numerical Operations improving significantly in the expected direction (Vocab. $t = 4.154$, df 169, $p \leq .001$; Numerical Operations $t = 4.263$, df 174, $p \leq .001$). Problem Solving, however, declined significantly ($t = -2.004$, df 178, $p \leq .05$). The sample size and variance of scores varied widely among subtests. This discrepancy should be kept in mind when interpreting the significance of differences as classical tests for the statistical significance of differences between scores are affected by both variations in sample size and differences in variability of scores. It is also important to note that tests could only be completed for students for whom both pre- and post-test measures were included as part of the year end data report filed by lab coordinators to the central office; the sample size for this comparison is substantially smaller than the entire group of NovaNET participants.

Figure 2: Pre- vs. Post- Mean ABLE Sub-test Score



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3. What is the average amount of time spent per student using NovaNET? Is there a general trend among schools?

As seen in Table 4, hours invested in each NovaNET subject varied widely across the 19 schools, with average time online ranging from 17.03 – 45.01 hours. Across all schools, the highest average time invested was in Science ($\bar{X}$ = 45.01 hours), Social Studies ($\bar{X}$ = 43.81 hours), and Math ($\bar{X}$ = 40.80 hours), contrasted with the least amount of time expended on English ($\bar{X}$ = 30.43 hours) and Electives ($\bar{X}$ = 17.03 hours). Table 5 demonstrates the wide variety in the pattern of time spent on each subject at each individual school. No significant pattern among schools emerged.

TABLE 4: Hours On Line by Subject

Subject	n	Mean hours spent on line	Minimum	Maximum
Science	220	45.01	1.00	209.83
Social Studies	232	43.81	0.65	327.00
Math	605	40.80	0.50	324.33
English	326	30.43	1.25	162.67
Electives	108	17.03	0.25	154.00

TABLE 5: Average Hours On Line by Subject by School

School Name	Average Time Online	Science Time Online	Soc.Stud. Time Online	Math Time Online	English Time Online	Elective Time Online
1. Mary E. Phillips High	77.54	75.53	79.77	76.58	58.82	97.00
2. Apex High	76.87	86.69	75.97	115.22	64.17	42.32
3. Fuquay-Varina High	53.75	46.50	37.00	58.5	-	73.00
4. Wakefield High	51.00	-	-	68.00	34.00	-
5. Green Hope High	47.73	55.89	40.90	61.65	40.65	39.57
6. Sanderson	44.60	30.00	96.00	50.57	24.62	21.80
7. Cary High	42.10	56.67	37.18	43.10	-	31.45
8. Millbrook High	39.39	41.00	45.00	39.83	39.36	31.75
9. Southeast Raleigh High	38.38	41.31	42.66	49.46	32.10	26.39
10. Garner High	37.83	46.37	43.81	46.31	33.57	19.09
11. Athens Drive High	31.45	31.12	33.03	35.33	26.30	-
12. East Wake High	25.70	65.50	-	13.56	18.08	5.65
13. Broughton High	24.71	23.69	24.46	29.22	30.38	15.81
14. Leesville Road High	22.67	59.89	17.61	6.25	6.93	-
15. Richard Milburn High	20.50	22.86	19.33	24.52	15.80	20.00
16. Wake Forest-Rolesville High	16.41	15.75	3.50	22.14	24.24	-
17. Longview Middle/High (6-12)	15.83	6.75	-	43.30	19.25	-
18. Enloe High	9.61	5.75	16.21	9.88	8.90	7.31
19. Mt. Vernon Redirection (6-8)	Data missing	Data missing	Data missing	Data missing	Data missing	Data missing

- no course recorded

As seen in Table 6, exploring the relationship between time on line and either post-course grades or course credit earned highlights a modest result of the NovaNET program. A small, but statistically significant, positive correlation exists between time on line and grades for Science, Social Studies, Math, and English; no such relationship exists for Electives. Progress made toward graduation (credits earned) has a similarly modest positive correlation with time spent on line.

TABLE 6: Hours On Line by Post-Course Grade

Subject	n	Correlation (R) Time Online x Course Grade	Sig.
Science	220	.26	$p \leq .01$
Social Studies	232	.18	$p \leq .05$
Math	605	.14	$p \leq .01$
English	326	.19	$p \leq .05$
Electives	108	.004	not sig.
		Time Online x Credit Earned	
Across subjects	1491	.15	$p \leq .001$

4. In what ways do student participants of NovaNET feel they have or have not benefited from NovaNET?

"NovaNET is the best thing that happened to me during my high school career.
I believe that it is the only reason I want to go to college...
I learned how to study and learn, that in order to succeed you have to ask questions,
that I really do need to do my homework,
and that "checks and balances" don't fit in my purse...
I will never forget everything NovaNET has done for my future,
and I thank you truly for everything you have done and gone through just for me."
Student participant

NovaNET appeals to students for a variety of reasons. Statistics, test scores, and numbers of participants only begin to capture the value of NovaNET in the lives of students. Sentiments like those of the NovaNET participant quoted above reveal many dimensions of the impact of the program. Not only did students learn, they often learned how to learn, and occasionally they were reminded that they were capable of learning. The student quoted above was a junior who was failing prior to her experience with NovaNET; currently in her senior year, she is on the AB Honor Roll. Like this individual, the program participants consulted in 25 interviews and 79 surveys consistently referred to relational, academic, or personal benefits that reach far beyond the subject knowledge they acquired. Data from 18 teachers (surveys), 18 lab coordinators (13 focus group/10 interviews/5 both), and 15 guidance counselors (13 focus group/2 surveys) richly echoed these stories of impact on student lives.

As illustrated in Table 7, most commonly, students identified the ability to "work at their own pace" as what they liked best about NovaNET. Out of the 104 students who participated in interviews (25) or returned surveys (79), 83 (80%) highlighted this benefit. As a result of the relaxed pace, they claimed to feel less stressed, less rushed, and less frustrated in the lab than in their traditional classes. A

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small number of students (5%) emphasized that this made the lab a fun, healthy, relaxing learning environment.

Table 7: NovaNET Benefits – The Students' Perspective

- Benefits of the Learning Environment
  - Self-pacing (80%)
  - Teacher Encouragement (38%)
    - *Examples:* NovaNET teacher became an advocate for students.
      Students believe their NovaNET teacher cares.
      The students receive individualized attention.
  - A second chance, the ability to catch up (37%)
  - A fun, healthy, relaxing learning environment (5%)
- Program Effects
  - Graduation (33%)
    - Prevention of drop-outs
    - Recovery of on-time graduation
  - Motivation & Self esteem (5%)
    - Consider college for the first time
    - Students feel hopeful, see a way out, see light at end of tunnel
    - Builds self confidence
    - Improves self-image

Second in response frequency (38%) was the importance of the consistent, persistent, individualized support students received from their NovaNET teacher. The focused attention they received allowed them to build a friendly, supportive relationship. One student commented that, compared to her NovaNET instructor, teachers in her other classes "*don't even know me.*" One lab coordinator suggested that, in NovaNET, students found a teacher who said, *"I am not going to let you fail."* Thriving in this setting, students often succeeded academically, gained self-confidence, and grew in their understanding of and engagement in the process of learning. One lab coordinator highlighted the importance of this individualized attention when she cautioned against allowing the program to grow too rapidly, lest the program's ability to attend individually to students be compromised.

NovaNET participants also commented frequently (37%) that NovaNET provided them with a second chance, the ability to learn from their mistakes. Unlike many traditional classrooms, in the computer lab students were able to re-take assignments and tests until they understood and mastered the material. They also enjoyed the lack of homework and the open book tests.

The NovaNET learning experience had direct effects on students' lives and attitudes. Many (33%) articulated that NovaNET allowed them to catch up and graduate with their class. One student described the lesson she learned this way, "*It is a great second chance for any student who may have messed around or slacked off in a class or two. And it helped me realize that you don't always get a second chance, so you should take care of your business the first time.*" A small number of students (5%) also were aware that NovaNET influenced their motivation and attitude about life, school, and themselves. "*NovaNET empowers you to attain the goals you have set for yourself,*" said one student. Others claimed, *"Some people think that they can't do well in school, so they give up on themselves. This*

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program makes kids get the help they need," and *"The only way to get a bad grade in NovaNET is if you just don't care."* One described the impact of his NovaNET experience this way:

> *For the first time in high school I enjoyed taking math. NovaNET made me more motivated. I wish I had been able to be a part of the program previous to this year. I enjoyed working at my own pace and having someone available to help me when I need it. Taking NovaNET made me realize I could get better than a C in Math and realizing that motivated me to work a little harder and get an A.*

Seven percent of program participants offered suggestions for improving the NovaNET program. Students agreed that their interest and motivation to use NovaNET would have been enhanced by a more interactive design and more graphics, rather than the version they had used, which offered little or no graphics, color, realism, or interaction. Four students recommended a Windows version of the program with "point and click" options, rather than the syntax version they used which required knowledge of the precise verbal commands accepted by the program. Six students commented that having access to written materials coordinated with the NovaNET lessons or the ability to print lessons would be helpful. Students also were frustrated by the "pickiness" of the program, which did not accept reasonable synonyms for lesson vocabulary, or alternative mathematical notation.

One important potential application of NovaNET is with students who are homebound. Such students may be capable of completing schoolwork, but not able to attend traditional classes. One of 13 homebound students participating in NovaNET was interviewed extensively. She described NovaNET as a "lifeline" but also suggested that students like herself, dependent on NovaNET for major portions of their educational experience, needed state-of-the-art computer equipment to minimize the delays and frustrations caused by problems with technology. She also reflected that access to text materials and the ability to print lessons are especially important to students outside of the support structure of the school setting. The ability to stop and rest without the program timing out and shutting down would be helpful to students dealing with illnesses. As with other adolescents, relationships are of key importance to homebound high school students; a chat room or discussion format (student-to-student as well as student-to-teacher) would be very valuable.

5. In what ways do NovaNET coordinators, teachers and guidance counselors believe NovaNET benefits or does not benefit student participants?

As reflected in Table 8, the 18 lab coordinators, 18 teachers, and 15 guidance counselors consulted believed that NovaNET most benefited students by preventing drop outs, providing a second chance for students to catch-up or improve failing grades, and improving student outlooks on their education. By far the most frequently mentioned benefit of NovaNET by adult respondents in this study (38 of the 51 respondents) was the prevention of drop outs, through providing students with a second chance to recover their high school diploma. Cases of successful graduation recovery credited *entirely* to NovaNET were highlighted by 19 out of 51 professionals participating in the study. Several lab coordinators told stories of NovaNET graduates who were the first in their family to receive a high school

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diploma. The program was described by one guidance counselor as their high school's *"most powerful drop-out prevention tool!"*

Thirteen teachers and lab coordinators specified the second chance that NovaNET offered students as an important reason for its positive impact on students. One social worker reflecting on this opportunity to recover or catch-up summarized her thoughts this way: "*It has allowed many students to pull themselves out of a pretty deep hole and go on from there.*"

Beyond practical issues such as graduation, one word resonated throughout the comments of adult participants in this study regarding the impact of NovaNET on students. That word was HOPE. School personnel (13) spontaneously used the word hope to refer to the rejuvenating effect of NovaNET on student outlooks. One lab coordinator explained,

> *The students feel more hopeful when they can feel better about one part of their life. It has a ripple effect. They no longer feel like something is hanging over their head, and can see the light at the end of the tunnel. Then they can think more clearly, set goals, show discipline..."*

Lab coordinators and counselors described other dimensions of the impact of NovaNET that went beyond the knowledge students learned in computer sessions, such as increasing student self-confidence and study skills. A teacher referring students to NovaNET stated, "*NovaNET students have accomplished more than they thought they could and more than others believed them capable of.*" Another individual reflected, "*It is amazing what it does for their self confidence.*" One lab coordinator echoed these thoughts with, *"I have seen students do things with NovaNET that they never did in class. It is amazing!"* These quotes, all from individuals who have directly observed the benefits participants have received, sketch a profile of the potential impact of this innovative program.

All of the lab coordinators interviewed (10) concurred that students who remained unmotivated had continued attendance problems, were unable to focus and work independently, and lacked reading skills would not benefit or would struggle with NovaNET. While they insisted that the program was not for everyone, they acknowledged it as an important asset to many students not thriving in traditional classrooms. In the arsenal of interventions for at-risk students, the lab coordinators interviewed awarded NovaNET their highest rating.

Table 8: NovaNET Benefits –
The Lab Coordinators' Perspective

Prevention of Drop Outs (Highlighted by 38 of 46 individuals interviewed)	
Provision of a second chance for students	(13)
Improvement in student encouragement / hope	(13)
Students who remain unmotivated, continue attendance problems, are unable to focus and work independently, and students with unusually poor reading skills will not benefit from NovaNET.	(46)

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6. How are students selected to participate in NovaNET? Is there a general trend from school to school?

As seen in Table 2, among schools with well developed, long standing, and well staffed NovaNET programs such as Cary High School, Athens Drive High School, Garner High School, and Apex High School, the process of referring students to the NovaNET lab was also well-developed. In such schools, guidance counselors, teachers, and social workers were informed about NovaNET and referred students on a regular basis. At these schools, the students were also aware of the program and asked to participate. These well-developed referral mechanisms, as well as the high profile of NovaNET at such schools, typically resulted in higher rates of participation.

Schools varied in the degree to which systems were in place to adequately identify all students who might benefit from NovaNET. Several schools were late in initiating their program (Sanderson, Longview), did not have full time NovaNET staff (Broughton), or lacked administrative support (East Wake High). Personnel at these schools indicated that it would only be during the third year of the program that they would fully implement a well developed referral process, or teacher orientation strategy, that would allow the program to meaningfully funnel the maximum number of appropriate candidates into the NovaNET lab. The time required to develop a system that worked well for their individual schools, coupled with the lack of personnel available to invest time in the program, and lack of administrative support, were the reasons given by six lab coordinators for making slow progress with NovaNET program setup.

At all schools countywide, the primary referral mechanism for NovaNET was the school guidance program. The most frequent referrals to NovaNET, according to students as well as lab coordinators (over 80%) came from counselor recommendations. Typical catalysts alerting counselors to consider NovaNET referral were failure in traditional classes, serious attendance issues, and personal issues such as illness or pregnancy. Seniors who needed course credit in order to graduate received highest priority when labs were full. Students who transferred to Wake County during high school were also offered NovaNET as a means to make up coursework needed to meet state graduation requirements.

As teachers learned more about the NovaNET opportunity and developed confidence in its results, referrals began to originate within the classroom. The degree of teacher awareness and confidence in NovaNET varied across schools. Typically, strong administrative support and the availability of a full time lab coordinator heighten the program's profile. At Cary High School, for example, with a well-established and well-supported NovaNET program, teachers regularly refer students and comment about the value of the program. The success of the program, both in terms of numbers of students participating and numbers of students graduating as a result of NovaNET is consequently high.

7. How is NovaNET implemented at each campus? Is there a general trend among schools?

Where NovaNET had been actively developed, it was typically used widely and creatively (See Table 2). These programs often had standing room only and waiting lists. Their chief concern about NovaNET was the need for more portals. Where administrative support or staffing was missing, or where schools had experienced moves, administrative changes, or other barriers to implementation, the success of the program was limited. Seven of the county's high schools made limited use of NovaNET – primarily for enrichment, course competency, and test preparation - not as a serious tool for course recovery or remediation. Four labs were not yet established due to space or staffing issues, or were just getting started at the time of this study

Eight reporting schools noted using NovaNET (or beginning to employ it) during every period of the day. The busiest made it available during lunch as well as during either alpha or omega periods (before or after school) and in the evening. Four schools reported integrating NovaNET into summer school programs. Many would like to see it used more extensively, expanded into middle schools, as well as concurrently with traditional classroom instruction, as a bulwark to prevent students from experiencing failure in standard classrooms.

The eight well established programs reported that the predominant NovaNET uses were recovery of course credit toward graduation or repairing a failing grade from a traditional course (remediation). Seniors who needed course credit in order to graduate received highest priority when labs were full. NovaNET was also frequently used to prepare for end-of-course exams and standardized tests, for electives, and for enrichment. Three schools reported using NovaNET successfully with students who were homebound for medical reasons; one school allowed special education students to use the program under their teacher's supervision.

The greatest variation in implementation resulted from the diverse and often resourceful attempts to staff the NovaNET lab. NovaNET personnel came from all walks, from varied teaching backgrounds, out of Guidance or Math departments, or through the ranks of volunteers and student interns. Schools that did not receive Safe Schools funds to underwrite a full time lab coordinator have allocated resources from a wide range of programs. Frequently two people share the position of administering the program (in combinations of lab coordinators and volunteers, lab coordinators and teachers, lab coordinators and guidance counselors, or 2 lab coordinators). NovaNET staffing arrangements therefore ranged from a full time coordinator supported by three academic specialists, to part-time teachers working with volunteers. This diversity drastically affected the school community's awareness of the program, the number of students referred, the schedule of NovaNET availability, and teacher support for NovaNET students.

8. What problems have NovaNET coordinators experienced? How severe are the problems? Are they easily solved?

As reflected in Table 9, a variety of problems were expressed by NovaNET lab coordinators, ranging from technical support requests, to staffing needs, to policy issues. None of the struggles reported were severe or insurmountable. Supporting the necessary staff to develop this intervention program was the greatest challenge. Beyond this financial demand, solving the problems and supplying the needs articulated by NovaNET staff appear to be attainable goals. One problem that those implementing NovaNET were NOT experiencing was with service from NovaNET developers. At every school, lab personnel noted prompt and efficient customer support.

Staffing issues were clearly the most salient struggle that lab coordinators experienced. Personnel from *every* school (100%) communicated the absolute necessity of having a full-time staff member to administer NovaNET – someone with the responsibility to oversee and coordinate the program, manage the assignment of course credit, and "sell" NovaNET to the faculty. Given the high school subject matter of NovaNET courses, all lab coordinators experienced the necessity of access to subject area specialists. Fourteen of 18 coordinators (13 in focus group, 10 interviewed, 5 both) suggested that truly successful implementation required the availability of at least two staff positions: a coordinator to manage the program and a teacher to work with the students in the lab. Both tasks are demanding and imperative to the success of the program. NovaNET coordinator positions were funded at 4 high schools through the Safe Schools program. At other schools, positions have been funded through alternative sources such as the Guidance or Math Departments; others were staffed with volunteers. Where no full time NovaNET position exists, personnel seemed at a loss as to how to add NovaNET to their already extensive responsibilities, and the program struggled. Another serious detriment to programs without NovaNET staff was that they had no "cheerleader" for the program – no one supplying energy, enthusiasm, and drive for its success.

Even two years into the Safe Schools program, many lab coordinators still needed help getting started, were experiencing problems developing referral processes, system administration, and/or tracking course credit. Half of the county's high schools did not actually begin their NovaNET program until the 2000-2001 school year, some during the second semester of that year. The demands of their other responsibilities as well as the immensity of initiating a NovaNET program made the task daunting. The need for uniform NovaNET policy and credit guidelines, facilitated by a lead, county-wide, NovaNET coordinator to assist and coordinate implementation, was suggested by three coordinators. Currently those decisions are made at the school level, the responsibility of either the administrator or lab coordinator. Although assistance in each of these areas would facilitate program development (as suggested by 8 lab coordinators), late starters were confident that the third year of the program would yield great results for the students at their schools.

Another concern expressed by seven of the 18 lab coordinators surveyed and interviewed was the need for more NovaNET portals. At the eight sites where the program was used extensively, labs were bursting at the seams, used every period of the day, and still students were waiting for terminals. Computer lab personnel in these labs were forced to turn students away.

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The need for administrative and teacher support was also a concern for six lab coordinators. One lab coordinator speculated that one could predict the success of the NovaNET program at any given school based on administrative/faculty support alone.

Lab coordinators less frequently mentioned technical or program concerns such as wiring problems, work disappearing on line, the inability for students to stop and rest without the program timing out and shutting down, and the desire for students to check their own grades. Four lab coordinators mentioned problems with the design of the program, such as the exactness of program vocabulary (not accepting reasonable synonyms) and the lack of interaction, animation or graphics. Two felt the need for further training in using NovaNET reports and other technicalities of the program. Also, without text or face-to-face support, the only way for students to receive additional information is to solve a problem incorrectly which prompts the program to provide additional instruction.

TABLE 9: Problems/needs experienced with NovaNET
(18 Lab Coordinators interviewed and/or surveyed)

At least one full time NovaNET lab coordinator at each school (18)
Subject area specialists available to computer lab (18)
Help getting started. / Help designing efficient, effective referral process (8)
Uniform policy / credit guidelines system-wide.
More NovaNET portals in labs with waiting lists and/or standing room only (7)
Administrative support for funding, staffing, (6)
approval to administer course credit for work completed on line, etc.
Programming suggestions (4)
Students should be able to view own grades
EOC's should be available on line
Ability to stop and take a break without program timing out
More interactive and attractive platform
Technical assistance: (2)
Further training
Help with reports
Problems with work disappearing in the system

9. Are overall gender, ethnicity, language, and special programs demographics of student participants representative of the overall WCPSS student population?

With over 100 language and cultural groups, and pronounced socio-economic differences, Wake County is a site of remarkable diversity. Administering a program across such a varied population holds many challenges. Exploring the demographic characteristics of NovaNET participants compared to the countywide system does reveal similarities as well as contrasts. Although the proportion of language minority students employing NovaNET (1.0% compared to 4.0% system-wide) mirrors the proportion in the larger system, comparisons of gender, ethnicity, and educational classifications, as well as the proportion of participating students who qualify for free/reduced lunch, reveal differences.

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As illustrated in Table 10 A, about 10% more males participate in NovaNET (60.3%) than their system-wide proportions (50.9%); female representation (39.7%) is 10% lower than system wide (49.1%) ($X^2 = 44.72$, df = 1, P ≤ 001). African Americans also participate in greater proportions than their system-wide percentages (47.1% vs. 26.2% respectively, $X^2 = 346.40$, df = 4, P ≤ 001). Given that NovaNET staff have reported that the program works well for at-risk students, these proportions could parallel the over-representation of African American males in the Wake County at-risk population. The proportion of NovaNET students who qualify for free or reduced lunch is also high compared to the proportion among high school students system wide (91.4% vs 20.0% system-wide, $X^2 = 895.40$, df = 1, p≤.001). With free lunch data missing for 80% of cases, the accuracy of this statistic is uncertain. Table 10 B illustrates the proportions of NovaNET students with various educational classifications compared to the system at large. Although many special needs classifications represented in NovaNET students are parallel with the larger system, the proportion of NovaNET Learning Disabled students is higher than the system at large.

TABLE 10 : DEMOGRAPHICS
NovaNET Participants vs. System-wide

10. A. GENDER & ETHNICITY & FREE LUNCH STATUS

Gender	#	% of NovaNET participants	Percent system wide ('99 WCPSS data)
Male	776	59.5 %	50.9 %
Female	511	39.2 %	49.1 %
Ethnicity			
African American	614	47.1 %	26.2 %
European American	574	44.0 %	63.2 %
Hispanic	63	4.8 %	4.6 %
Asian	18	1.4 %	3.9 %
Other / Mixed	35	2.7 %	2.1 %
Free/Reduced Lunch Status			
Free or Reduced Lunch	256	91.4 %	20.0 %
Total	**1304**	**100.0 %**	**100.0%**

Gender data missing: 82 cases; Ethnicity ;data missing: 65 cases; Free Lunch data missing: 1,113 cases.

10. B. EDUCATIONAL CLASSIFICATION

Educational Classification	#	% of NovaNET participants	Percent system wide ('99 WCPSS data)
Non-classified	964	69.9%	71.4%
Learning Disabled	212	16.4%	6.6 %
Behavioral Emotional Disabled	33	2.5 %	0.7 %
Educable Mentally Disabled	12	0.9 %	0.8 %
Speech/Language Impaired	6	0.5 %	2.0 %
Other Classification	77	5.7 %	3.2 %
Total	**1304**	**100.0 %**	**100.0%**

Educational classification data missing for 65 cases.

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Summary

The current evaluation provides a variety of insights into NovaNET online learning as a part of the Wake County Safe Schools' effort to provide optimal learning environments for all students. Although the newness of the program limits the size of its influence to date, where staffing, support, time, and space have allowed, NovaNET is used creatively, extensively, and with encouraging impact, as the following summary of positive results suggests.

- More than twice the projected number of students participated in NovaNET;
- 73.8% of attempted credits earned were successfully completed;
- 843 students are back on track for graduation as a result of NovaNET after being off-track for graduation with their class prior to NovaNET;
- Teachers consider NovaNET to be a great drop-out prevention tool;
- Teachers report that NovaNET improved student motivation, self-esteem, and hopefulness;
- Student-perceived advantages of NovaNET included:
  - self-pacing of the program,
  - one-on-one teacher attention,
  - a chance to catch up or recover academically, and
  - relaxing learning environment.
- NovaNET provided excellent customer support.

As with any new and innovative program presented to busy, already committed teachers, NovaNET has taken time to get established in Wake County. Several schools were just beginning their NovaNET program during the semester this evaluation took place (two years into the Safe Schools grant). Several more are actively involved in the program, but were still refining their processes. Several factors were consistently believed to directly impact implementation.

- All schools concurred that a full-time NovaNET coordinator is vital to the success of the program.
- Lack of access to subject area teachers made learning challenging subjects difficult.
- Many programs needed help getting started (i.e., help designing their referral process, understanding all aspects of the program, designing and managing a uniform course credit policy…)

- Insufficient numbers of portals forced busy labs to turn students away.
- Lack of administrator support was a challenge to any site.
- Lack of textbook support coordinated with NovaNET lessons limited student learning.
- Only three of the nearly 3,000 Wake County students involved in the Juvenile Justice system have participated in NovaNET.
- Wake County students do not have access to a variety of innovative, resourceful, and interactive programs (discussion forums, online, face-to-face access to instructors…) available in the NovaNET program.

Suggestions for improving the implementation of NovaNET, according to lab coordinators and students, include:

- A full time lab coordinator and instructional specialist are needed for each site.
- A Windows (rather than Syntax) version of NovaNET, along with more graphics, and online interaction with an instructor would increase ease of use and student motivation.
- Countywide collaboration concerning NovaNET procedures and policies (i.e., recruitment and assigning course credit) would allow newer programs to learn from those more established.
- Adding NovaNET to evening, summer school, and middle school classes.

Even with lack of full deployment, the NovaNET program is considered a vital intervention strategy by lab coordinators, teachers, guidance counselors, and students. Most NovaNET coordinators are excited about the third year of the Safe Schools initiative, when they believe they will finally be ready to employ NovaNET effectively. Evaluating the use and impact of NovaNET during the 2001-2002 school year is therefore vital to capturing an accurate portrait of the effectiveness of Safe Schools Strategy 17 and the value of online learning in reaching the educational goals of the Wake County Public School System.

NovaNET is a way to offer hope…and hope is hard to come by for the student who has experienced repeated failures.
Social Worker

You call it NovaNET. I call it a second chance for students who otherwise would be casualties of our educational system.
Computer lab coordinator

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Appendix A

NovaNET Interview – Lab Coordinators

To what degree is NovaNET used at your school?

How many computers are currently running NovaNET?

During what hours/times of the day/week is NovaNET used?

With what frequency as NovaNET used? (i.e. hours, number of students,…)

In what ways is NovaNET used? (course recovery, remediation, test prep., EOC's, ALP,…)

Is NovaNET used for courses required for graduation?

Is NovaNET used for content courses or otherwise?

How are students referred to NovaNET?

What criteria are used to select students for NovaNET?

Who usually refers students to the lab for NovaNET?

What impact has NovaNET had on students?

In what specific ways have NovaNET students benefited from NovaNET?

What kind of student does not benefit from NovaNET?

Can you share an example of a student who has had a successful experience with NovaNET?

How does NovaNET compare to other help available to students?

What problems do you have with the NovaNET program?

What one thing would help the most to increase NovaNET success at your school?

What recommendations do you have regarding NovaNET?

Appendix B

NovaNET Interview – Students

How were you referred to NovaNET?

What do you like about using NovaNET?

What do you NOT like about using NovaNET?

How have you benefited from NovaNET?

What characteristics of NovaNET help you be more successful as a student?

Can you share an example of how NovaNET has helped you in school?

What one thing would help the most to improve NovaNET?
(to make you like it more or make it more helpful)

What recommendations do you have regarding NovaNET?

Appendix C

NovaNET Questionnaire (Computer Lab Coordinators)

Name_____ School_____Phone/email_____.

To what degree is NovaNET used at your school? (i.e., frequency, number of students,...)

In what ways is NovaNET used? (i.e., core course recovery, electives, EOC competency,,...)

What affects whether NovaNET is used? (i.e., teachers, time, computer skill,...)

What impact has NovaNET had on students/teachers?

How does NovaNET compare to other help available to students?

What are the primary reasons that students struggle and/or fail?

What one thing would help the most to increase NovaNET use at your school?

What recommendations do you have regarding NovaNET?

Appendix D

NovaNET Questionnaire (Lead Counselors/Student Deans)

Name_____ School_____Phone/email_____.

To what degree is NovaNET used at your school?

What affects whether NovaNET is used?

What impact has NovaNET had on students/teachers?

What are the primary reasons that students struggle and/or fail?

Appendix E

NovaNET Survey # 1

(Designed by NovaNET Lab coordinator)

Please take a moment to give me a comment on your evaluation of the impact of the NovaNET program at your school. Discuss what you believe to be the strong points of the program.

Appendix F

NovaNET Survey # 2

(Designed by NovaNET Lab coordinator)

NovaNET Feedback Form

Student name_____Period_____

Two ways that NovaNET is positive for me are:

1.

2.

Two ways the NovaNET could be improved for me are:

1.

2.

The midterm and/or final exam on NovaNET was:

1. _____ easier than a traditional paper exam

2. _____ more difficult than a traditional paper exam.

Comments about the exam or the program which you would like to share:

Thank you for your input.

Appendix G

NovaNET Survey # 3

(Designed by NovaNET Lab coordinator)

NovaNET Lab Student Participation Questionnaire

Please respond honestly to the following questions.
You do not have to answer in complete sentences but you do have to answer each question.

Name _____

Age _____ Birthdate _____ Classification _____

Course taking in NovaNET _____

Counselor _____ Academic Coach _____

1. Describe your experience in the regular classroom setting.

2. What are your academic goals after graduation?

3. How were you referred to the NovaNET program?

4. Is this a program that should be funded next year? Why or why not?

5. Why are you successful or unsuccessful at school in general?

6. In what ways could the NovaNET program help students at your school?

7. Is the program easy to use and does it teach you the subject matter?

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